

SEQ ID NO:1
EBOGP1/MBGGP2 nucleotide sequence

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atcatttcttt	ctttgggtaa	ttatcctttt	ccaagaaca	ttttccatcc
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260	270	280	290	300
aaagatgggg	cttcaggtcc	ggtgtcccac	caaaggtggt	caattatgaa
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gctggtgaat	gggctgaaaa	ctgctacaat	cttgaaatca	aaaaacctga
360	370	380	390	400
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410	420	430	440	450
ggtgccggt	tgtgcacaaa	gtatcaggaa	cgggaccgtg	tgccggagac
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660	670	680	690	700
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caataccacg	ggaaaactaa	tttggaaaggt	caacccccgaa	attgatacaa
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tc

EBOGP1/MBGGP2 amino acid sequence

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AlaPheLeuIleLeuProGlnAlaLysLysAspPhePheSerSerHis
ProLeuArgGluProValAsnAlaThrGluAspProSerSerGlyTyrTyr
SerThrThrIleArgTyrGlnAlaThrGlyPheGlyThrAsnGluThrGlu
TyrLeuPheGluValAspAsnLeuThrTyrValGlnLeuGluSerArg
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LysArgSerAsnThrThrGlyLysLeuIleTrpLysValAsnProGluIle
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LeuThrThrLeuAlaThrIleSerThrSerProGlnSerLeuThrThrLys
ProGlyProAspAsnSerThrHisAsnThrProValTyrLysLeuAsp
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SerThrAlaSerAspThrProSerAlaThrThrAlaAlaGlyProProLys
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AspGlyLeuIleAsnAlaProIleAspPheAspProValProAsnThrLys
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GlnHisAlaSerProAsnIleSerLeuThrLeuSerTyrPheProAsnIle
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P000506.013102

SEQ ID NO:3
MBGGP1/EBOGP2 nucleotide sequence

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      760      770      780      790      800
gccaccaaac tcaataccac ggacccaagc agtgatgatg aggacctcgc

      810      820      830      840      850
aacatccggc tcaggggtccg gagaacgaga accccacaca acttctgatg

      860      870      880      890      900
cggtcaccaa gcaagggctt tcatcaacaa tgccaccac tccctcacca

      910      920      930      940      950
caaccaagca cgccacagca aggaggaaac aacacaaacc attcccaaga

      960      970      980      990      1000
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     1160     1170     1180     1190     1200
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     1210     1220     1230     1240     1250
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     1260     1270     1280     1290     1300
tccccccacc cccagctcga ctgcacaaca tcttgtatat ttcagaagaa

     1310     1320     1330     1340     1350
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     1360     1370     1380     1390     1400
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      1660      1670      1680      1690      1700
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      1710      1720      1730      1740      1750
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      1760      1770      1780      1790      1800
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SEQ ID NO:4

MBG1/EBO2 amino acid sequence

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 AsnValAspSerValCysSerGlyThrLeuGlnLysThrGluAspVal
 HisLeuMetGlyPheThrLeuSerGlyGlnLysValAlaAspSerProLeu
 GluAlaSerLysArgTrpAlaPheArgThrGlyValProProLysAsn
 ValGluTyrThrGluGlyGluGluAlaLysThrCysTyrAsnIleSerVal
 ThrAspProSerGlyLysSerLeuLeuLeuAspProProThrAsnIleArg
 AspTyrProLysCysLysThrIleHisHisIleGlnGlyGlnAsnPro
 HisAlaGlnGlyIleAlaLeuHisLeuTrpGlyAlaPhePheLeuTyrAsp
 ArgIleAlaSerThrThrMetTyrArgGlyLysValPheThrGluGlyAsn
 IleAlaAlaMetIleValAsnLysThrValHisLysMetIlePheSer

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ProThrAspAlaThrLysLeuAsnThrThrAspProSerSerAspAspGlu
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ThrSerAspAlaValThrLysGlnGlyLeuSerSerThrMetProProThr
ProSerProGlnProSerThrProGlnGlnGlyGlyAsnAsnThrAsnHis
SerGlnAspAlaValThrGluLeuAspLysAsnAsnThrThrAlaGln
ProSerMetProProHisAsnThrThrThrIleSerThrAsnAsnThrSer
LysHisAsnPheSerThrLeuSerAlaProLeuGlnAsnThrThrAsnAsp
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ValAspLysThrLeuProAspGlnGlyAspAsnAspAsnTrpTrpThr
GlyTrpArgGlnTrpIleProAlaGlyIleGlyValThrGlyValIleIle
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SEQ ID NO:5
MUSGP1/RVNGP2 nucleotide sequence

Sequence Range: 1 to 2046

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attcggtatg ctccggaact ctccagaaga cagaagacgt ccatctgatg

     160     170     180     190     200
ggattcacac tgagtgggca aaaagttgct gattcccctt tggaggcatc

     210     220     230     240     250
caagcgatgg gctttcagga caggtgtacc tcccaagaat gttgagtaca

     260     270     280     290     300
cagagggggga ggaagccaaa acatgctaca atataagtgt aacggatccc

     310     320     330     340     350
tctggaaaat ccttgctggt agatcctcct accaacaatcc gtgactatcc

     360     370     380     390     400
gaaatgcaaa actatccatc atattcaagg tcaaaaccct catgcacagg

     410     420     430     440     450
ggatcgccct tcatttatgg ggagcatttt ttctgtatga tcgcattgcc

     460     470     480     490     500
tccacaacaa tgtaccgagg caaagtcttc actgaaggga acatagcagc

     510     520     530     540     550
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     560     570     580     590     600
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     610     620     630     640     650
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     660     670     680     690     700
atacaattct acaaagaacc aaacatgtgc tccgtccaaa atacctccac

     710     720     730     740     750
cactgcccac agcccgtccg gagatcaaac tcacaagcac cccaactgat

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1006506.01103

[illegible]

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      1860      1870      1880      1890      1900
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      1910      1920      1930      1940      1950
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      1960      1970      1980      1990      2000
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SEQ ID NO:6

MUSGP1/RVNGP2 amino acid sequence

MetLysThrThrCysPheLeuIleSerLeuIleLeuIleGlnGlyThr
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GluAlaSerLysArgTrpAlaPheArgThrGlyValProProLysAsn
ValGluTyrThrGluGlyGluGluAlaLysThrCysTyrAsnIleSerVal
ThrAspProSerGlyLysSerLeuLeuLeuAspProProThrAsnIleArg
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RVNGP1/MUSGP2 nucleotide sequence

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210	220	230	240	250
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1010	1020	1030	1040	1050
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1960 1970 1980 1990 2000
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SEQ ID NO:8

RVNGP1/MUSGP2 amino acid sequence

MetLysThrIleTyrPheLeuIleSerLeuIleLeuIleGlnSerIleLys
ThrLeuProValLeuGluIleAlaSerAsnSerGlnProGlnAspVal
AspSerValCysSerGlyThrLeuGlnLysThrGluAspValHisLeuMet
GlyPheThrLeuSerGlyGlnLysValAlaAspSerProLeuGluAlaSer
LysArgTrpAlaPheArgThrGlyValProProLysAsnValGluTyr
ThrGluGlyGluGluAlaLysThrCysTyrAsnIleSerValThrAspPro
SerGlyLysSerLeuLeuAspProProSerAsnIleArgAspTyrPro
LysCysLysThrValHisHisIleGlnGlyGlnAsnProHisAlaGln
GlyIleAlaLeuHisLeuTrpGlyAlaPhePheLeuTyrAspArgValAla
SerThrThrMetTyrArgGlyLysValPheThrGluGlyAsnIleAlaAla
MetIleValAsnLysThrValHisArgMetIlePheSerArgGlnGly
GlnGlyTyrArgHisMetAsnLeuThrSerThrAsnLysTyrTrpThrSer
SerAsnGluThrGlnArgAsnAspThrGlyCysPheGlyIleLeuGlnGlu
TyrAsnSerThrAsnAsnGlnThrCysProProSerLeuLysProPro
SerLeuProThrValThrProSerIleHisSerThrAsnThrGlnIleAsn
ThrAlaLysSerGlyThrMetAsnProSerSerAspAspGluAspLeuMet
IleSerGlySerGlySerGlyGluGlnGlyProHisThrThrLeuAsn
ValValThrGluGlnLysGlnSerSerThrIleLeuSerThrProSerLeu
HisProSerThrSerGlnHisGluGlnAsnSerThrAsnProSerArgHis
AlaValThrGluHisAsnGlyThrAspProThrThrGlnProAlaThr

2025 RELEASE UNDER E.O. 14176

LeuLeuAsnAsnThrAsnThrThrProThrTyrAsnThrLeuLysTyrAsn
 LeuSerThrProSerProProThrArgAsnIleThrAsnAsnAspThrGln
 ArgGluLeuAlaGluSerGluGlnThrAsnAlaGlnLeuAsnThrThr
 LeuAspProThrGluAsnProThrThrGlyGlnAspThrAsnSerThrThr
 AsnIleIleMetThrThrSerAspIleThrSerLysHisProThrAsnSer
 SerProAspSerSerProThrThrArgProProIleTyrPheArgLys
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 LeuIleAsnAlaProIleAspPheAspProValProAsnThrLysThrIle
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 AlaLeuSerCysIleCysArgIlePheThrLysTyrIleGly*

SEQ ID NO:9

MBGGP1/MBGGP2 nucleotide sequence

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aaaatgtgga	ttcggatatgc	tccggaactc	tccagaagac	agaagacgtc
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catctgatgg	gattcacact	gagtgggcaa	aaagttgctg	attccccctt
210	220	230	240	250


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      760      770      780      790      800
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      810      820      830      840      850
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      860      870      880      890      900
tcaccaagca agggctttca tcaacaatgc caccactcc ctcaccacaa
      910      920      930      940      950
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      960      970      980      990      1000
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      1010      1020      1030      1040      1050
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2017-09-09 10:00:00

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cccgccacaa cggcaccaaa cacgacaaat gagcatttca ccagtcctcc
      1260      1270      1280      1290      1300
ccccaccccc agctcgactg cacaacatct tgtatatattc agaagaaagc
      1310      1320      1330      1340      1350
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      1360      1370      1380      1390      1400
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      1410      1420      1430      1440      1450
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      1460      1470      1480      1490      1500
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      1560      1570      1580      1590      1600
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2015-05-05 10:00:00

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ThrSerAspAlaValThrLysGlnGlyLeuSerSerThrMetProProThr
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SEQ ID NO:11

EBOGP1/EBOGP2 nucleotide sequence

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110	120	130	140	150
cacttgaggt	catccacaat	agcacattac	aggttagtga	tgtcgacaaa
160	170	180	190	200
ctagtttgtc	gtgacaaact	gtcatccaca	aatcaattga	gatcagttgg

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      310      320      330      340      350
gctggtgaat gggctgaaaa ctgctacaat cttgaaatca aaaaacctga

      360      370      380      390      400
cgggagtgag tgtctaccag cagcgccaga cgggattcgg ggcttcccc

      410      420      430      440      450
ggtgccggta tgtgcacaaa gtatcaggaa cgggaccgtg tgccggagac

      460      470      480      490      500
tttgcccttc ataaagaggg tgctttcttc ctgtatgata gacttgcttc

      510      520      530      540      550
cacagttatc taccgaggaa cgactttcgc tgaaggtgtc gttgcatttc

      560      570      580      590      600
tgatactgcc ccaagctaag aaggacttct tcagctcaca ccccttgaga

      610      620      630      640      650
gagccgggtca atgcaacgga ggaccctgtc agtgggtact attctaccac

      660      670      680      690      700
aattagatat caggctaccg gttttggaac caatgagaca gagtacttgt

      710      720      730      740      750
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      810      820      830      840      850
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      860      870      880      890      900
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attcgcagtg aagagttgtc tttcacagtt gtatcaaacy gagccaaaaa

      960      970      980      990      1000
catcagtggg cagagtcagg cgcgaaactt ttccgaccca gggaccaaca

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caacaactga agaccacaaa atcatgggctt cagaaaaattc ctctgcaatg

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EBOGP1/EBOGP2 amino acid sequence

MetGlyValThrGlyIleLeuGlnLeuProArgAspArgPheLys
ArgThrSerPhePheLeuTrpValIleIleLeuPheGlnArgThrPhe
SerIleProLeuGlyValIleHisAsnSerThrLeuGlnValSerAsp
ValAspLysLeuValCysArgAspLysLeuSerSerThrAsnGlnLeuArg
SerValGlyLeuAsnLeuGluGlyAsnGlyValAlaThrAspValProSer
AlaThrLysArgTrpGlyPheArgSerGlyValProProLysValVal
AsnTyrGluAlaGlyGluTrpAlaGluAsnCysTyrAsnLeuGluIleLys
LysProAspGlySerGluCysLeuProAlaAlaProAspGlyIleArgGly
PheProArgCysArgTyrValHisLysValSerGlyThrGlyProCys
AlaGlyAspPheAlaPheHisLysGluGlyAlaPhePheLeuTyrAspArg
LeuAlaSerThrValIleTyrArgGlyThrThrPheAlaGluGlyValVal
AlaPheLeuIleLeuProGlnAlaLysLysAspPhePheSerSerHis
ProLeuArgGluProValAsnAlaThrGluAspProSerSerGlyTyrTyr
SerThrThrIleArgTyrGlnAlaThrGlyPheGlyThrAsnGluThrGlu
TyrLeuPheGluValAspAsnLeuThrTyrValGlnLeuGluSerArg
PheThrProGlnPheLeuLeuGlnLeuAsnGluThrIleTyrThrSerGly
LysArgSerAsnThrThrGlyLysLeuIleTrpLysValAsnProGluIle
AspThrThrIleGlyGluTrpAlaPheTrpGluThrLysLysAsnLeu
ThrArgLysIleArgSerGluGluLeuSerPheThrValValSerAsnGly
AlaLysAsnIleSerGlyGlnSerProAlaArgThrSerSerAspProGly
ThrAsnThrThrThrGluAspHisLysIleMetAlaSerGluAsnSer
SerAlaMetValGlnValHisSerGlnGlyArgGluAlaAlaValSerHis
LeuThrThrLeuAlaThrIleSerThrSerProGlnSerLeuThrThrLys
ProGlyProAspAsnSerThrHisAsnThrProValTyrLysLeuAsp

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IleSerGluAlaThrGlnValGluGlnHisHisArgArgThrAspAsnAsp
 SerThrAlaSerAspThrProSerAlaThrThrAlaAlaGlyProProLys
 AlaGluAsnThrAsnThrSerLysSerThrAspPheLeuAspProAla
 ThrThrThrSerProGlnAsnHisSerGluThrAlaGlyAsnAsnAsnThr
 HisHisGlnAspThrGlyGluGluSerAlaSerSerGlyLysLeuGlyLeu>
 IleThrAsnThrIleAlaGlyValAlaGlyLeuIleThrGlyGlyArg
 ArgThrArgArgSerAlaIleValAsnAlaGlnProLysCysAsnProAsn
 LeuHisTyrTrpThrThrGlnAspGluGlyAlaAlaIleGlyLeuAlaTrp
 IleProTyrPheGlyProAlaAlaGluGlyIleTyrIleGluGlyLeu
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 ThrThrGlnAlaLeuGlnLeuPheLeuArgAlaThrThrGluLeuArgThr
 PheSerIleLeuAsnArgLysAlaIleAspPheLeuLeuGlnArgTrp
 GlyGlyThrCysHisIleLeuGlyProAspCysCysIleGluProHisAsp
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 AspLysThrLeuProAspGlnGlyAspAsnAspAsnTrpTrpThrGly
 TrpArgGlnTrpIleProAlaGlyIleGlyValThrGlyValIleIleAla
 ValIleAlaLeuPheCysIleCysLysPheValPhe*

SEQ ID NO:13

RVNGP1/RVNGP2 nucleotide sequence

10	20	30	40	50
atgaagacca	tatattttct	gattagtctc	attttaatcc	aaagtataaa
60	70	80	90	100
aactctccct	gttttagaaa	ttgctagtaa	cagccaacct	caagatgtag
110	120	130	140	150
attcagtgtg	ctccggaacc	ctccaaaaga	cagaagatgt	tcattctgatg
160	170	180	190	200
ggattttacac	tgagtgggca	aaaagttgct	gattcccctt	tggaagcatc
210	220	230	240	250
taaacgatgg	gctttcagga	caggtgttcc	tccaagaac	gttgagtata

260	270	280	290	300
cggaaggaga	agaagccaaa	acatgttaca	atataagtgt	aacagaccct
310	320	330	340	350
tctggaaaat	ccttgctgct	ggatcctccc	agtaatatcc	gcgattaccc
360	370	380	390	400
taaatgtaaa	actgttcatc	atattcaagg	tcaaaaccct	catgcacagg
410	420	430	440	450
ggattgcctt	ccatttgttg	ggggcatttt	tcttgatatga	tcgcgttgcc
460	470	480	490	500
tctacaacaa	tgtaccgagg	caaggtcttc	actgaaggaa	atatagcagc
510	520	530	540	550
tatgattgtt	aataagacag	ttcacagaat	gattttttct	aggcaaggac
560	570	580	590	600
aaggttatcg	tcacatgaac	ttgacctcca	ccaataaata	ttggacaagc
610	620	630	640	650
agcaatgaaa	cgcagagaaa	tgatacggga	tgtttttgga	tcctccaaga
660	670	680	690	700
atacaactcc	acaaacaatc	aaacatgccc	tccatctctt	aaacctccat
710	720	730	740	750
ccctgcccac	agtaactccg	agcattcact	ctacaaatac	tcaaattaat
760	770	780	790	800
actgctaaat	ctggaactat	gaacccaagt	agcgacgatg	aggaccttat
810	820	830	840	850
gatttccggc	tcaggatctg	gagaacaggg	gccccacaca	actcttaatg
860	870	880	890	900
tagtcactga	acagaaacaa	tcgtcaacaa	tattgtccac	tccttcacta
910	920	930	940	950
catccaagca	cctcacaaca	tgagcaaaac	agtacgaatc	cttccccgaca
960	970	980	990	1000
tgctgtaact	gagcacaatg	gaaccgaccc	aacaacacaa	ccagcaacgc
1010	1020	1030	1040	1050
tcctcaacaa	tactaataca	actcccacct	ataacactct	caagtacaac
1060	1070	1080	1090	1100
ctcagtactc	cttcccctcc	aaccgcgaac	atcaccaata	atgatacaca
1110	1120	1130	1140	1150
acgtgaacta	gcagaaagcg	aacaaaccaa	tgctcagttg	aacacaactc

1160	1170	1180	1190	1200
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1210	1220	1230	1240	1250
aacatcatca	tgacgacatc	agatataaca	agcaaacacc	ccacaaaattc
1260	1270	1280	1290	1300
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1660	1670	1680	1690	1700
aatcagaaca	atttagtttg	taggttgagg	cgcttagcta	atcaaactgc
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1760	1770	1780	1790	1800
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1860	1870	1880	1890	1900
taaaaatatc	tcagaacaaa	tcgacaaaat	cagaaaggat	gaacaaaagg
1910	1920	1930	1940	1950
aggaaactgg	ctgggggtcta	ggtggcaaat	ggtggacatc	tgactgggggt
1960	1970	1980	1990	2000
gttctcacca	atttgggcat	cctgctacta	ttatctatag	ctgttctgat
2010	2020	2030	2040	
tgctctgtcc	tgtatctgtc	gtatcttcac	taaatacatt	ggatga

RVNGP1/RVNGP2 amino acid sequence

MetLysThrIleTyrPheLeuIleSerLeuIleLeuIleGlnSerIleLys
ThrLeuProValLeuGluIleAlaSerAsnSerGlnProGlnAspVal
AspSerValCysSerGlyThrLeuGlnLysThrGluAspValHisLeuMet
GlyPheThrLeuSerGlyGlnLysValAlaAspSerProLeuGluAlaSer
LysArgTrpAlaPheArgThrGlyValProProLysAsnValGluTyr
ThrGluGlyGluGluAlaLysThrCysTyrAsnIleSerValThrAspPro
SerGlyLysSerLeuLeuLeuAspProProSerAsnIleArgAspTyrPro
LysCysLysThrValHisHisIleGlnGlyGlnAsnProHisAlaGln
GlyIleAlaLeuHisLeuTrpGlyAlaPhePheLeuTyrAspArgValAla
SerThrThrMetTyrArgGlyLysValPheThrGluGlyAsnIleAlaAla
MetIleValAsnLysThrValHisArgMetIlePheSerArgGlnGly
GlnGlyTyrArgHisMetAsnLeuThrSerThrAsnLysTyrTrpThrSer
SerAsnGluThrGlnArgAsnAspThrGlyCysPheGlyIleLeuGlnGlu
TyrAsnSerThrAsnAsnGlnThrCysProProSerLeuLysProPro
SerLeuProThrValThrProSerIleHisSerThrAsnThrGlnIleAsn
ThrAlaLysSerGlyThrMetAsnProSerSerAspAspGluAspLeuMet
IleSerGlySerGlySerGlyGluGlnGlyProHisThrThrLeuAsn
ValValThrGluGlnLysLysGlnSerSerThrIleLeuSerThrProSerLeu
HisProSerThrSerGlnHisGluGlnAsnSerThrAsnProSerArgHis
AlaValThrGluHisAsnGlyThrAspProThrThrGlnProAlaThr
LeuLeuAsnAsnThrAsnThrThrProThrTyrAsnThrLeuLysTyrAsn
LeuSerThrProSerProProThrArgAsnIleThrAsnAsnAspThrGln
ArgGluLeuAlaGluSerGluGlnThrAsnAlaGlnLeuAsnThrThr
LeuAspProThrGluAsnProThrThrGlyGlnAspThrAsnSerThrThr
AsnIleIleMetThrThrSerAspIleThrSerLysHisProThrAsnSer
SerProAspSerSerProThrThrArgProProIleTyrPheArgLys
LysArgSerIlePheTrpLysGluGlyAspIlePheProPheLeuAspGly
LeuIleAsnThrGluIleAspPheAspProIleProAsnThrGluThrIle
PheAspGluSerProSerPheAsnThrSerThrAsnGluGluGlnHis
ThrProProAsnIleSerLeuThrPheSerTyrPheProAspLysAsnGly

SEQ ID NO:24
MBGV RVN (5-AAG CTT CGA CAT GAA GAC CAT AT-3');

SEQ ID NO:25

GP2 forward (containing PvuI) MBGV MUS (5'-AGC GAT CGA TCC
TCT GGA G -3'),

SEQ ID NO:26

MBGV RVN (5'-AAC GAT CGA TTT TCT GGA A-3');

SEQ ID NO:27

GP1 reverse (containing PvuI) MBGV MUS (5'-GAT CGA TCG CTT
TCT TCT G-3'),

SEQ ID NO:28

MBGV RVN (5'-AAA TCG ATC GTT TCT TTC TAA AG-3');

SEQ ID NO:29

GP2 reverse (containing EcoRI) MBGV MUS (5'-CGA ATT CCG TTA
TCC GAT ATA T-3'),

SEQ ID NO:30

MBGV RVN (5'-CGA ATT CTG TCA TCC AAT GTA T-3').

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